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EXAMINER

NGUYEN, STEVE N

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/691,644	<b>Applicant(s)</b> KIM ET AL.	
	<b>Examiner</b> STEVE NGUYEN	<b>Art Unit</b> 2117	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 18-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 November 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

Claims 1-17 are currently pending.

### ***Election/Restrictions***

Applicant's election without traverse of invention Group I, claims 1-17 in the reply filed on 11/20/2007 is acknowledged. Claims 18-21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Objections***

Claim 1 recites, "wherein the HARQ state machines are provided only one enabled HARQ state machine if ACK/NACK delay is 1 slot." This limitation is grammatically incorrect.

Claim 5 recites that the at least two HARQ state machines comprise two HARQ state machines. This limitation is meaningless and is improper for failing to further limit the parent claim.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01.

Claim 1 recites, “wherein the HARQ state machines are provided only one enabled HARQ state machine if ACK/NACK delay is 1 slot.” The omitted elements are: those elements which relate ACK/NACK delay and slots with the physical layer, HARQ controller, and HARQ state machines. Currently it is unclear an “ACK/NACK delay” is and how it is even related to the claimed apparatus. Furthermore, it is unclear what length of time “1 slot” is because the essential elements relating to “slots” has been omitted.

Claims 1, 6, 8, and 17 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites that an amount of delay for the response comprises 2 slots. There is insufficient antecedent basis for “the response”. Furthermore, claim 6 is contradictory with claim 1. Claim 6 requires the delay for the response to be 2 slots,

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while claim 1 recites limitations for the delaying being 1 slot. These limitations of claim 1 are meaningless since the delay is always 2 slots as recited in claim 6.

Claim 8 recites: the initial state; the control state; the demodulation state; the waiting state; the decoding state; and the response state. There is insufficient antecedent basis for these limitations.

Claim 17 recites, "the upper layer". There is insufficient antecedent basis for this limitation.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
- 
1. Claims 1-17 rejected under 35 U.S.C. 103(a) as being unpatentable over Seidel et al (US Pat. 6,658,005; hereinafter referred to as Seidel) in view of Fong et al (US Pat. 6,760,860; hereinafter referred to as Fong).

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As per claim 1:

Seidel teaches an apparatus for controlling the operation of the data channel in a mobile communication system that simultaneously a control message over the data control channel and the data over the data channel and supports hybrid automatic repeat request (HARQ) (abstract), the apparatus:

- a physical layer (col. 7, lines 62-65) for receiving the traffic data and the control message from the data control channel and the data channel separately and decoding the received traffic data and control data (col. 2, lines 26-28);
- processing a result of the decoding of at least one of the received control message and data (col. 7, lines 26-28; the result of decoding the sequence numbers in step 260 is used to decode PDUs in step 270) and for controlling the physical layer according to a result of the processing (col. 7, lines 35-37; an ACK must be sent on the physical layer according to the definition as provided above).

Not explicitly disclosed by Seidel is a physical layer's HARQ controller that performs an operation of a MAC layer. However, Fong in an analogous art teaches a physical layer's HARQ controller (col. 5, lines 9-18) that performs ARQ operations (which is an operation of the MAC layer). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the HARQ operations of Seidel to operate in the physical layer. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that the teachings of Fong would

have enabled the cooperative use of layer 1 and layer 2 ARQ to avoid unnecessary retransmission requests (col. 4, lines 51-57).

Seidel teaches receiving data from the physical layer (col. 7, lines 62-65); and determining an action based on the data received (col. 7, lines 35-37). Not explicitly disclosed by Seidel or Fong is that the physical layer's HARQ controller comprises at least two HARQ state machines for receiving state information from the physical layer and determining a state transition to next state; and a state function section for controlling the state transition of the at least two HARQ state machines depending on the result of the determining of the state transition.

However, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to implement the actions of Seidel above using state machines such as the one shown in Fig. 5. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that state machines are models of a system, and that the system of Seidel could have been modeled using state diagrams which were well known to those in the art.

As per claim 2:

Seidel further teaches the apparatus of claim 1, wherein:

- the at least two HARQ state machines for control the state transition among a plurality of states, wherein the plurality of states includes an initial state for initializing parameters while waiting for the control message to be received over the control channel (Fig. 5, step 100), a control message decoding state for

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decoding the control message, a control state for calculating a result of the control message decoding (Fig. 5, element 260), a demodulation state for demodulating the received data channel (Fig. 5, element 270), a data decoding state for turbo decoding the demodulated data (Seidel teaches that Turbo encoding can be used in col. 5, lines 24-29; therefore the packet must be decoded), and a response state for transmitting a response based on a result of the turbo-decoding (col. 7, lines 32-34).

As per claim 3:

Seidel further teaches the apparatus of claim 1, further comprising a data path processor for controlling a processing path of data received over the data channel (processing is done by a processor in col. 5, lines 37-40).

As per claim 4:

Seidel further teaches the apparatus of claim 1, further comprising an output buffer controller for storing data obtained by demodulating and decoding data received over the data channel and outputting the stored data to the HARQ controller (a buffer controller must be present for the combining to take place as described in col. 7, lines 29-32).

As per claim 5:

Seidel further teaches the apparatus of claim 1, wherein the at least two HARQ state machines comprise two HARQ state machines (Fig. 5; the state machine outlines the method of Seidel. However, it would have been obvious to equivalently express the state machine separately for the transmitter and the receiver).



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As per claim 6:

Seidel further teaches the apparatus of claim 5, wherein an amount of delay for the response comprises 2 slots, wherein each of the two HARQ state machines alternately controls the state transition for 2 slots for the data received over the data channel (Fig. 5; the state machine controls the state transition for steps 260 and 270 which are two slots of data).

As per claim 7:

Seidel and Fong teach the apparatus of claim 6 above. Not explicitly disclosed is wherein decoding the data in the physical layer, the two HARQ state machines controls a transition to a waiting state until previous decoding operation of the decoder has ended.

However, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to transition to a waiting state on a state machine. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that the packet must first be decoded before further action can be taken.

As per claim 8:

Seidel further teaches state processors for performing control operations of the HARQ state machine (col. 5, lines 37-40).

As per claim 9:

Seidel further teaches the apparatus of claim 1, wherein the physical layer comprises one data channel turbo decoder (Seidel teaches that Turbo encoding can be used in col. 5, lines 24-29).

As per claim 10:

Seidel further teaches the apparatus of claim 1, wherein the data channel is decoded by a turbo decoder (Seidel teaches that Turbo encoding can be used in col. 5, lines 24-29; therefore the packet must be decoded with a decoder).

As per claim 11:

Seidel further teaches the apparatus of claim 1, wherein the physical layer's HARQ controller requests a retransmission of the data from the mobile communication system when the results of the decoding indicate that the decoding was unsuccessful (col. 7, lines 33-34).

As per claim 12:

Seidel further teaches the apparatus of claim 1, wherein the physical layer's HARQ controller transmits the decoded data to an upper layer when results of the decoding indicate that the decoding was successful (col. 7, lines 32-33).

As per claim 13:

Seidel further teaches the apparatus of claim 1, wherein the physical layer comprises a control channel decoder for decoding the received control messages (Fig. 5, element 260), a demodulator for demodulating the received data, and a data decoder for decoding the demodulated data (Fig. 5, element 270).

As per claim 14:

Seidel further teaches the apparatus of claim 13, wherein the physical layer's HARQ controller determines whether to demodulate the data depending on the decoded control message and outputs the decoded control message to the demodulator and the data decoder when the HARQ controller determines to demodulate the data (col. 7, lines 23-28; the data is demodulated and decoded depending on the sequence numbers received on the control channel).

As per claim 15:

Seidel further teaches the apparatus of claim 1, wherein the physical layer's HARQ controller determines whether to demodulate the data depending on the processed result and outputs the result of the decoded control message to the physical layer when the HARQ controller determines to demodulate the data (col. 7, lines 23-28; the data is demodulated and decoded depending on the calculation of the beginning of the frame which is determined by the sequence numbers received on the control channel).

As per claim 16:

Seidel further teaches the apparatus of claim 1, wherein the physical layer's HARQ controller determine whether to demodulate and decode the received data depending on the result of the decoding of the control message, outputs the decoded control message to the demodulator and the decoder during demodulation, decoding the received data (col. 7, lines 23-28; the data is demodulated and decoded depending on the sequence numbers received on the control channel), and controlling the output of

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a response signal according to the result of the decoding of the data (col. 7, lines 35-37).

As per claim 17:

Seidel further teaches apparatus of claim 1, wherein the physical layer's HARQ controller delivers the decoded data to the upper layer (col. 7, lines 32-33).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEVE NGUYEN whose telephone number is (571)272-7214. The examiner can normally be reached on M-F, 10am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jacques Louis-Jacques can be reached on (571) 272-6962. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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